The Examiner rejected claims 1-2, 4, 6-7, 9 and 11-13 under 35 U.S.C. §103 as unpatentable over Kujoory (USP 6,021,263) in view of Zhang (IEEE Network, September 1993, pp. 8-18) (OA, ¶2, pages 3-4). With this Amendment, Applicants cancel these claims, and submit new claims 33-38, which generally correspond to the cancelled claims.

With respect to claims 1-2, 4, 6-7, 9 and 11-13, the Examiner asserted that Zhang cures the deficiency of Kujoory since, according to the Examiner, Zhang discloses a table for storing an incoming and outgoing interfaces such as virtual connections "path state" (OA, page 3, lines 12-13). Applicants respectfully submit that the "path state" in Zhang does not correspond to "virtual connections (VCs)" in the present invention.

The "path state" in Zhang includes the "incoming link upstream" and the "outgoing links downstream" (page 12, right column, lines 30-34) and is used in forwarding reservation messages (page 14). To achieve resource reservation in Zhang, "certain resources, such as a share of bandwidth or a number of buffers" are set aside for a particular flow (page 8, right column, "Resource Reservation"), whereby the particular flow of packets will be transferred with a specified quality of service.

In Zhang, however, the "path state" stored for reservation-message forwarding is not used in transferring packets, for which the resource reservation is achieved, from the incoming link to the outgoing links. Therefore, Applicants respectfully submit that Zhang does not teach or suggest in combination with Kujoory "transferring a packet, for which the resource reservation is achieved, from the first VC to the second VC

LAW OFFICES
INNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.
TANFORD RESEARCH PARK
700 HANSEN WAY
PALO ALTO, CALIF. 94304
650-849-6600

according to the correspondence relationship stored in the memory" as recited in new claims 33, 35, and 37.

For at least the reasons above, Applicants submit that claims 33, 35, and 37 are patentable over the combination of Kujoory and Zhang. Since claims 34, 36, and 38 depend from claims 33, 35, and 37, respectively, Applicants submit that these claims are patentable for at least the same reasons.

The Examiner also rejected claims 17-19, 21 and 23-24 under 35 U.S.C. §103 as unpatentable over Birman (IBM Research Report, RC 20250 (10/27/95)) in view of Zhang (OA, ¶2, pages 4-5). With this Amendment, Applicants cancel these claims, and submit new claims 39-43, which generally correspond to the cancelled claims.

With respect to claims 17-19, 21 and 23-24, the Examiner asserted that Birman discloses "setup a path state between source and destination for establishing a short cut path," which corresponds, according to the Examiner, to storing a correspondence relationship between a first VC and a second VC (OA, page 4, lines 11-12). Applicants respectfully traverse the Examiner's assertion.

In Birman, packets are transferred through the short cut path that is different from the route shown by the path state (Fig. 4), *i.e.*, transferred not in accordance with the path state. Therefore, Birman does not teach "transferring a packet, for which the resource reservation is achieved, from the first VC to the second VC according to the stored correspondence relationship" as recited in new claim 39. Zhang does not cure this deficiency of Birman, as explained above with respect to claims 33, 35, and 37.

LAW OFFICES
FINNEGAN, HENDERSON,
FARABOW, GARRETT
& DUNNER, L.L.P.
STANFORD RESEARCH PARK
700 HANSEN WAY
PALO ALTO, CALIF. 94304
650-849-6600

For at least the reasons above, Applicants submit that claim 39 is patentable over the combination of Birman and Zhang. Since claims 40-43 depend from claim 39, Applicants submit that these claims are patentable as well.

The Examiner further rejected claims 26-32 under 35 U.S.C. §103 as unpatentable over Birman in view of Zhang (OA, ¶2, pages 5-6). However, the Examiner provides the reasons for rejection only for claim 26, and not for another independent claim 32.

With respect to claim 26, Applicants respectfully traverse the Examiner's rejection with this Amendment. The Examiner asserted that Zhang cures the deficiency of Birman since, according to the Examiner, Zhang discloses a memory for maintaining setup information such as flow specification (OA, page 5, lines 16-18). However, Zhang does not teach or suggest in combination with Birman "maintaining a connection to said one of the nodes based on receipt of the message, the connection being a part of the dedicated VC" as recited in amended claim 26.

Furthermore, since the short cut VC is set up on a different route than the RSVP message passed in Birman (Fig. 4), Birman, even if modified in accordance with Zhang's teaching, fails to teach or suggest "receiving a message ... from one of the nodes" and "maintaining a connection to said one of the nodes" as in amended claim 26.

The Examiner also asserted that, even without Zhang's teaching, one of ordinary skill in the art would have known that Birman's router would have a memory for maintaining a dedicated channel (OA, page 6, lines 1-3). However, since the short cut VC takes a different route than the message in Birman, as stated above, Applicants

LAW OFFICES
INNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.
TANFORD RESEARCH PARK
700 HANSEN WAY
PALO ALTO, CALIF. 94304
650-849-6600

respectfully submit that even Birman's router having a memory for maintaining does not suggest the invention of claim 26.

With respect to claim 32, Applicants respectfully submit that neither Birman nor Zhang teach or suggest "transmitting an identifier of the dedicated VC onto the dedicated VC" and "receiving the identifier through the default VC" as already recited in claim 32.

For at least the reasons above, Applicants submit that independent claims 26 and 32 are patentable over the combination of Birman and Zhang, and that claims 27-31, which depend from claim 26, are patentable as well.

In view of the foregoing amendments and remarks, Applicant respectfully requests the reconsideration and reexamination of this application and the timely allowance of the pending claims 3, 5, 8, 10, 14-16, 20, 22, 25-43.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.

Dated: July 13, 2001

By: Linda J. Thayer
Linda J. Thayer
Reg. No. 45,681

LAW OFFICES
NNEGAN, HENDERSON,
FARABOW, GARRETT
& DUNNER, L.L.P.
ANFORD RESEARCH PARK
700 HANSEN WAY
'ALO ALTO, CALIF. 94304
650-849-6600

APPENDIX

3. (Amended) [The apparatus according to claim 2,] A router apparatus, comprising:

a memory capable of storing a correspondence relationship between a first virtual connection to be used in receiving a packet from one logical network and a second virtual connection to be used in transmitting the packet to another logical network;

means for receiving a first message for resource reservation from said another logical network;

means for transmitting a second message for the resource reservation based on the first message received by the means for receiving to said one logical network when existence of the first and second virtual connections is detected, and determining not to transmit the second message when the existence is not detected and the resource reservation is judged not to be achieved;

means for transferring the packet received through the first virtual connection onto the second virtual connection according to the correspondence relationship stored in the memory; and

wherein the means for transmitting includes means for determining whether to transmit the second message responsive to the existence, when a quality of service indicated in the first message is judged not to become satisfied unless the packet is transferred by the means for transferring.

8. (Amended) [The apparatus according to claim 7,] A router apparatus, comprising:

LAW OFFICES
INNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.
TANFORD RESEARCH PARK
700 HANSEN WAY
PALO ALTO, CALIF. 94304
650-849-6600

a memory capable of storing a correspondence relationship between a first virtual connection to be used in receiving a packet from one logical network and a second virtual connection to be used in transmitting the packet to another logical network;

means for receiving a first message for resource reservation from said another logical network;

means for transmitting a second message for the resource reservation based on the first message received by the means for receiving to said one logical network;

means for canceling the second message transmitted by the means for transmitting when either the first or second virtual connection does not exist and the resource reservation is judged not to be achieved;

means for transferring the packet received through the first virtual connection onto the second virtual connection according to the correspondence relationship stored in the memory; and

wherein the means for canceling includes means for determining whether to cancel the second message responsive to the existence, when a quality of service indicated in the first message is judges not to become satisfied unless the packet is transferred by the means for transferring.

14. (Amended) [The method according to claim 12, further comprising the steps of:] A method of operating a router usable to transfer a packet from a first node belonging to one logical network to a second node belonging to another logical network, comprising the steps of:

receiving a first message for resource reservation from the second node;

LAW OFFICES
INNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.
TANFORD RESEARCH PARK
700 HANSEN WAY
PALO ALTO, CALIF. 94304
650-849-6600

storing a correspondence relationship between a first virtual connection available for receiving a packet of a specified flow from the first node and a second virtual connection available for transmitting the packet of the specified flow to the second node, when the first and second virtual connections exist;

transmitting a second message for the resource reservation based on the first message to the first node, when the correspondence relationship can be stored;

determining not to transmit the second message, when the correspondence relationship cannot be stored and the resource reservation is judged not to be achieved;

transferring a packet received through the first virtual connection onto the second virtual connection according to the stored correspondence relationship;

transferring, at a network layer, a packet from said one logical network to said another logical network; and

transmitting the second message irrespective of whether or not the correspondence relationship can be stored, when the resource reservation required by the first message can be achieved by scheduling the network-layer transferring step.

15. (Amended) [The method according to claim 13, further comprising the steps of:] A method of operating a router usable to transfer a packet from a first node belonging to one logical network to a second node belonging to another logical network, comprising the steps of:

receiving a first message for resource reservation from the second node;

storing a correspondence relationship between a first virtual connection available for receiving a packet of a specified flow from the first node and a second virtual

LAW OFFICES
INNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.
TANFORD RESEARCH PARK
700 HANSEN WAY
PALO ALTO, CALIF. 94304
650-849-6600

connection available for transmitting the packet of the specified flow to the second node, when the first and second virtual connections exist;

transmitting a second message for the resource reservation based on the first message to the first node, when the correspondence relationship can be stored;

determining not to transmit the second message, when the correspondence relationship cannot be stored and the resource reservation is judged not to be achieved;

requesting, in response to the first message, a set-up of the first virtual connection to said one logical network;

transferring a packet received through the first virtual connection onto the second virtual connection according to the stored correspondence relationship; and

transmitting a third message for notifying a failure of the resource reservation required by the first message to the second node, when the second virtual connection does not exist and the resource reservation required by the first message is judged not to be achieved unless the packet can be transferred by the transferring step.

20. (Amended) [The method according to claim 18, further comprising the step of:] A method of operating a router usable to transfer a packet from a first node belonging to one logical network to a second node belonging to another logical network, comprising the steps of:

receiving a first message for resource reservation from the second node;

transmitting a second message for the resource reservation based on the first message to the first node;

storing a correspondence relationship between a first virtual connection available for receiving a packet of a specified flow from the first node and a second virtual

LAW OFFICES
INNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.
TANFORD RESEARCH PARK
700 HANSEN WAY
PALO ALTO, CALIF. 94304
650-849-6600

connection available for transmitting the packet of the specified flow to the second node, when the first and second virtual connections exist;

transmitting a cancellation message to the first node for canceling the second message, when the correspondence relationship cannot be stored and the resource reservation is judged not to be achieved;

transferring a packet received through the first virtual connection onto the second virtual connection according to the stored correspondence relationship; and

transferring, at a network layer, a packet from said one logical network to said another logical network,

and wherein the step of transmitting the cancellation message includes the step of determining to transmit the cancellation message, when neither scheduling the network-layer transferring step nor storing the correspondence relationship can achieve the resource reservation required by the first message.

22. (Amended) [The method according to claim 19, further comprising the steps of:] A method of operating a router usable to transfer a packet from a first node belonging to one logical network to a second node belonging to another logical network, comprising the steps of:

receiving a first message for resource reservation from the second node;

transmitting a second message for the resource reservation based on the first message to the first node;

storing a correspondence relationship between a first virtual connection available for receiving a packet of a specified flow from the first node and a second virtual

LAW OFFICES
INNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.
TANFORD RESEARCH PARK
700 HANSEN WAY
PALO ALTO, CALIF. 94304
650-849-6600

connection available for transmitting the packet of the specified flow to the second node, when the first and second virtual connections exist;

transmitting a cancellation message to the first node for canceling the second message, when the correspondence relationship cannot be stored and the resource reservation is judged not to be achieved;

setting up, in response to the first message, the second virtual connection in said another logical network;

transferring a packet received through the first virtual connection onto the second virtual connection according to the stored correspondence relationship; and

waiting for the first virtual connection set up for a predetermined period,

and wherein the step of transmitting the cancellation message includes the step of determining to transmit the cancellation message, when the first virtual connection is not set up after the waiting step and the resource reservation required by the first message is judged not to be achieved unless the packet can be transferred by the transferring step.

26. (Amended) A method of transferring a packet from one logical network to a plurality of nodes belonging to another logical network via a router, a default virtual connection being set up between the router and each of the nodes, comprising the steps of:

setting up a dedicated virtual connection from the router to at least one of the nodes, the dedicated virtual connection being dedicated for transmitting a packet of a specified flow to the nodes and capable of being a point-to-multipoint connection;

LAW OFFICES
INNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.
TANFORD RESEARCH PARK
700 HANSEN WAY
PALO ALTO, CALIF. 94304
650-849-6600

transferring the packet of the specified flow received from said one logical network onto the dedicated virtual connection without a network-layer destination analysis;

receiving a message through the default virtual connection from one of the nodes; and

maintaining [the dedicated virtual connection] a connection to said one of the nodes based on receipt of the message, the connection being a part of the dedicated virtual connection.

LAW OFFICES
INNEGAN, HENDERSON,
FARABOW, GARRETT
& DUNNER, L.L.P.
TANFORD RESEARCH PARK
700 HANSEN WAY
PALO ALTO, CALIF. 94304
650-849-6600